

What is claimed:

1. A method for patterning an optical element, comprising steps of:

providing a lower mold with a carrier face;

5 positioning said optical element on said carrier face of said lower mold;

providing an upper mold above said optical element, said upper mold having a pressing face, and a plurality of protrusions with pre-determined patterns mounted on said pressing  
10 face;

thermally pressing down said upper mold so as to insert said protrusions into said optical element; and

separating said upper mold from said optical element for forming a plurality of patterns corresponding to said  
15 protrusions on said optical element.

2. The method of Claim 1, further comprising a cooling step operated by a plurality of cooling pipes mounted in said lower mold during the thermal pressing step, and said cooling pipes  
20 being used to cool down said optical element in the thermal pressing step so as to prevent said optical element from bending.

3. The method of Claim 1, wherein said optical element is positioned and fixed on said carrier face of said lower mold. by a holding component.

5           4. The method of Claim 1, wherein said upper mold is operated at a thermal pressing temperature during the thermal pressing step, and the thermal pressing temperature is the melting temperature of said optical element.

10           5. The method of Claim 1, wherein said upper mold is driven by a driving device during the thermal press step, and said driving device is mounted with said upper mold.

15           6. The method of Claim 1, wherein said optical element is a light guiding plate.

            7. The method of Claim 1, wherein said optical element is made of acrylic materials.

20           8. The method of Claim 1, wherein said optical element is a diffusing sheet.

            9. The method of Claim 1, wherein said upper mold is made of copper alloy.

10. The method of Claim 1, wherein said upper mold is heated by a heater during the thermal pressing step so that said protrusions are heated to thermally press said optical element.

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11. The method of Claim 1, wherein said protrusions are in a V shape and said patterns formed on said optical element are V-shaped grooves.

10 12. A apparatus for patterning an optical element with a thermal pressing process, comprising:

a lower mold with a carrier face for positioning said optical element thereon, and a plurality of cooling pipes being mounted in said lower mold;

15 a holding component disposed on said carrier face to fix said optical element;

an upper mold with a pressing face corresponded to said carrier face and a plurality of protrusions of predetermined patterns being mounted on said pressing face, and said upper mold  
20 having a heater mounted therein; and

a driving device connected to said upper mold to drive said upper mold during said thermal pressing process.

13. The apparatus of Claim 12, wherein said plurality of cooling pipes is used to cool down said optical element during the thermal pressing process so as to prevent said optical element from bending.

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14. The apparatus of Claim 12, wherein said upper mold and said lower mold are made of copper alloy.

15. The apparatus of Claim 12, wherein said heater heats said upper mold to a predetermined temperature for said thermal pressing process.

16. The apparatus of Claim 12, wherein said upper mold is operated under a thermal pressing temperature during said thermal pressing process, and said thermal pressing temperature of said upper mold is a melting temperature of said optical element.

17. The apparatus of Claim 12, wherein said protrusions are in a V shape and said patterns formed on said optical element are V-shaped grooves.

18. The apparatus of Claim 12, wherein said optical element is a light guiding plate.

19. The apparatus of Claim 12, wherein said optical element is a diffusing sheet.

20. The apparatus of Claim 12, wherein said optical element  
5 is made of acrylic materials.